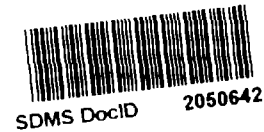


June 10, 2004

Ms. Toni Hemerka, Borough Manager
Borough of Bally
P.O. Box 217
Bally, PA 19503



RE: REVIEW OF 5/25/04 ARCADIS LETTER/REPORT
ON PRELIMINARY PUMPING TEST OF [REDACTED]
SOUTH TEST WELL

Dear Ms. Hemerka:

In accordance with your request and that of the Borough's Engineer, Mr. Greg Unger, P.E., of Systems Design Engineering, Inc., I reviewed the above-referenced letter/report which was forwarded to me by Mike Bedard of ARCADIS. The analysis presented in the report is a good first step which appears to demonstrate no dramatic short-term drawdown from the [REDACTED] South Test Well on the area of the existing plume. However, we need a more convincing demonstration of a lack of even subtle drawdown in the area of the plume, which will require a more detailed pumping testing with an even greater number of observation wells as we discussed in the field.

I also have several concerns and problems with the interpretations that ARCADIS presents in this preliminary report, as discussed below:

1. RECHARGE BEFORE PUMPING TEST

There was a rising water-level trend during the pumping test at two key observation points, Municipal Well #1 and Observation Well 87-81. The beginning of this rising trend was almost coincident with the start of the pumping test and it probably stemmed from recharge caused by the rainfall which immediately preceded the pumping test. This rising water-level trend, with an onset coincident with the start of pumping, may have masked any subtle drawdown at these two key observation points from the pumping test.

2. BRUNSWICK SHALE LESS PERMEABLE THAN FANGLOMERATE ?????

The first page of the ARCADIS report describes the shales of the Brunswick Formation as less permeable than the Fanglomerate. This interpretation is highly questionable. It is inconsistent with the regional literature; and it does not appear to be borne out by local well-yield data. Two high-yielding wells, Bally Municipal

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Well #1 and Bally Municipal Well #3, are developed in the Brunswick Formation shale and siltstone, and these wells have yields comparable to the yield found in the Shuhler South Test Well in the Fanglomerate. The fracture permeability (joints, bedding-plane partings, etc.) of the Brunswick Formation shale and siltstone is probably therefore not significantly different than that of the Fanglomerate.

Fanglomerate

3. INTERPRETATION OF FANGLOMERATES RESIDING IN SYCLINAL CORES

ARCADIS suggests that the Fanglomerate lobes or tongues are an indication of folding. They interpret them to be residing in synclinal cores, and hence an indication of folding. This interpretation, while possible, is not the typical or pervasive interpretation of the nature of the Fanglomerates along the northwest border of the Triassic Newark Basin. The Fanglomerates are not typically interpreted to be tabular and laterally continuous members. An interpretation of lateral continuity would be required to give the Fanglomerates a structural significance in this case, such as the ARCADIS interpretation which places the two lobes of Fanglomerate in the Bally area as resident in synclinal cores. Rather, the Fanglomerates are typically interpreted to be discontinuous, fan- (hence the name "Fanglomerate"), lobe- or tongue-shaped deposits of conglomerate where ancient stream channels entered the northwest border of the Triassic Basin (see Table 12A-1, p. 184, & Figure 12A-16, p. 197, of *The Geology of Pennsylvania*, 1999, Charles H. Shultz, Ed., Special Publication 1 of the PA Geological Survey and the Pittsburgh Geological Society).

It is far more likely that the two lobes of Fanglomerate in the Bally area are simply separate discontinuous deposits rather than two bodies of a once laterally continuous conglomerate unit preserved in synclinal cores. Basing an interpretation of folding in part on the presence of the Fanglomerate lobes is dubious.

4. COMPILATION OF STRUCTURAL FEATURES NEEDED

ARCADIS notes that "local and regional geologic mapping and field observations appear to indicate that the local strike of bedding is in a northwest-southeast orientation." It would probably be worthwhile for all of the various

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hydrogeologists involved in this case (EPA, PaDEP, DRBC, ARCADIS, and PGC) if they could compile this information onto one map.

As part of this compilation, ARCADIS may want to consider that there is a subtle topographic grain of minor valleys (possible less-resistant beds) and minor ridges (possible resistant beds) in the area to the northeast of Bally between the existing VOC plume and the [REDACTED] South Test well, which could, as is often the case, be a reflection of bedding strike. I have noted this grain on an attached topographic map. If this NE-SW topographic grain does reflect bedding strike, it is inconsistent with the conclusion of ARCADIS that strike is to the northwest-southeast. Although in the area of the [REDACTED] South Test Well this topographic grain changes from NE-SW to NW-SE as shown on the attached map.

There is also one key geologic feature that could be a NE-SW ground-water-flow pathway, that hasn't been much discussed up to this point. This is the Northwest Triassic Border Fault which falls near: (1) the VOC plume, (2) existing Municipal Well #1, (3) existing Municipal Well #3, and (4) the [REDACTED] South Test Well. Should ARCADIS move ahead with a more detailed and formal pumping test of a well on the [REDACTED] South tract, it would probably be a good idea to have at least observation well along this key border fault.

Please call if you have any questions.

Sincerely,

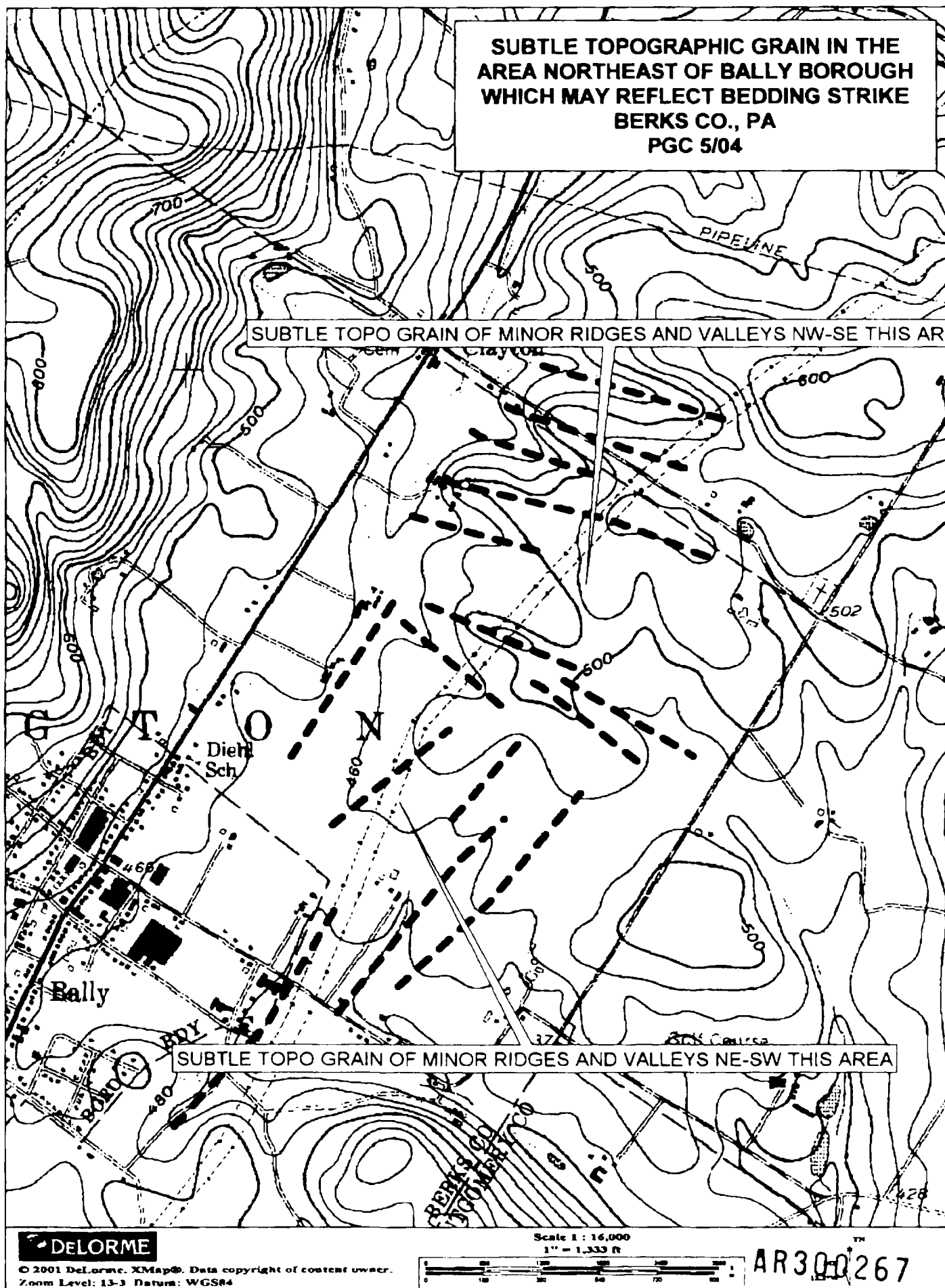
Peffer Geotechnical Corporation

Jeff Peffer, P.G., P.E., President

cc: Greg Unger, SDEI
Mike Bedard, ARCADIS
Tom Fridirici, PaDEP
Mitch Cron, USEPA
Kathy Davies, USEPA

W/ attached topo map

AR300266



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PH 717 938-0164 FAX 938-0165

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☐ INQUIRY ☐ MEMO ☐ TELEGRAM
DATED _____ NO. _____

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